

Phys.G12-Q3W8- Quarter 3-Revision and Exam-H.W.

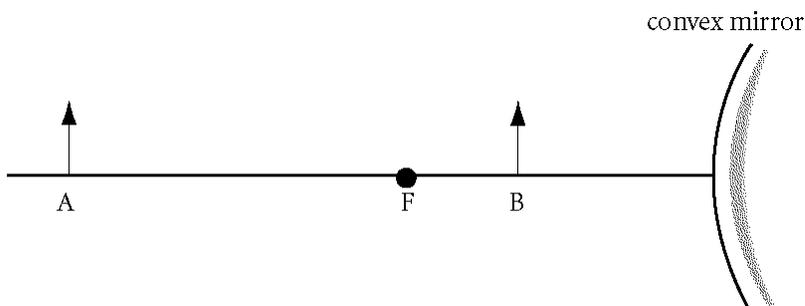
Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Which of the following best describes the image produced by a flat mirror?
- real, upright, and magnification equal to one
 - real, inverted, and magnification less than one
 - virtual, inverted, and magnification greater than one
 - virtual, upright, and magnification equal to one
- _____ 2. Which portion of the electromagnetic spectrum is used to identify fluorescent minerals?
- infrared waves
 - gamma rays
 - ultraviolet light
 - X rays
- _____ 3. A mirror has an object located on its principal axis 40.0 cm from the mirror's surface. A virtual image is formed 15.0 cm behind the mirror. What is the mirror's focal length?
- 24.0 cm
 - 13 cm
 - 2.38 cm
 - 10.9 cm
- _____ 4. A film projector produces a 1.51 m image of a horse on a screen. If the projector lens is 4.00 m from the screen and the size of the horse on the film is 1.07 cm, what is the magnitude of the magnification of the image?
- 7.08×10^{-3}
 - 0.708
 - 141
 - 14.1
- _____ 5. An object is placed 20.0 cm from a thin converging lens along the axis of the lens. If a real image forms behind the lens at a distance of 8.00 cm from the lens, what is the focal length of the lens?
- 13.3 cm
 - 5.71 cm
 - 12.0 cm
 - 13.3 cm
- _____ 6. In a double-slit interference experiment, a wave from one slit arrives at a point on a screen one-half wavelength behind the wave from the other slit. What is observed at that point?
- gray fringe, neither dark nor bright
 - bright fringe
 - dark fringe
 - multicolored fringe
- _____ 7. When a glass rod is rubbed with silk and becomes positively charged,
- protons are removed from the silk.
 - electrons are removed from the rod.
 - protons are added to the silk.
 - the silk remains neutral.
- _____ 8. The acronym *laser* stands for light amplification by _____ emission of radiation.
- similar
 - stimulated
 - simultaneous
 - spontaneous
- _____ 9. The farther light is from a source,
- the more light is available per unit area.
 - the more bright light becomes.
 - the more spread out light becomes.
 - the more condensed light becomes.
- _____ 10. If you stand 3.0 m in front of a flat mirror, how far away from you would your image be in the mirror?
- 12.0 m
 - 1.5 m
 - 3.0 m
 - 6.0 m
- _____ 11. All of the following images can be formed by a converging lens *except* which one?
- virtual, inverted, and same size
 - real, inverted, and same size
 - real, inverted, and reduced
 - image at infinity

- ___ 12. A convex mirror with a focal length of -20.0 cm has an object 30.0 cm in front of the mirror. What is the value of q for the corresponding image?
- 12 cm
 - -60 cm
 - 60 cm
 - -12 cm
- ___ 13. A virtual image has a ___ image distance (q) and is located in ___ of the lens.
- positive, front
 - positive, back
 - negative, front
 - negative, back
- ___ 14. Which of the following is *not* a characteristic of electrical potential energy?
- It is associated with a charge in an electric field.
 - It results from the interaction between charges.
 - It results from a single charge.
 - It is a form of mechanical energy.
- ___ 15. Both insulators and conductors can be charged by
- induction.
 - polarization.
 - grounding.
 - contact.
- ___ 16. If a light ray strikes a flat mirror at an angle of 30° from the normal, the ray will be reflected at an angle of
- 60° from the normal.
 - 90° from the normal.
 - 30° from the mirror's surface.
 - 60° from the mirror's surface.
- ___ 17. An object that is 18 cm from a converging lens forms a real image 22.5 cm from the lens. What is the magnification of the image?
- -1.25
 - 0.80
 - -0.80
 - 1.25
- ___ 18. Tripling the current in a circuit with constant resistance has the effect of changing the power by what factor?
- $\frac{1}{3}$
 - $\frac{1}{9}$
 - 9
 - 3
- ___ 19. In what direction does a parallel ray from an object proceed after passing through a converging lens?
- The ray passes through the focal point, F .
 - The ray passes through the center of the lens.
 - The ray continues parallel to the principal axis.
 - The ray is directed away from the focal point, F .
- ___ 20. The focal length for a diverging lens is
- dependent on the location of the image.
 - always positive.
 - dependent on the location of the object.
 - always negative.
- ___ 21. When two parallel mirrors are placed so that their reflective sides face each other, ___ images form. This is because the image in one mirror becomes the ___ for the other mirror.
- multiple, object
 - inverted, center of curvature
 - reduced, virtual image
 - enlarged, focal point
- ___ 22. At the first dark band in a single-slit diffraction pattern, the path lengths of selected pairs of wavelets differ by
- less than half of one wavelength.
 - one-half wavelength.
 - more than one wavelength.
 - one wavelength.
- ___ 23. Part of a pencil that is placed in a glass of water appears bent in relation to the part of the pencil that extends out of the water. What is this phenomenon called?
- reflection
 - interference
 - refraction
 - diffraction

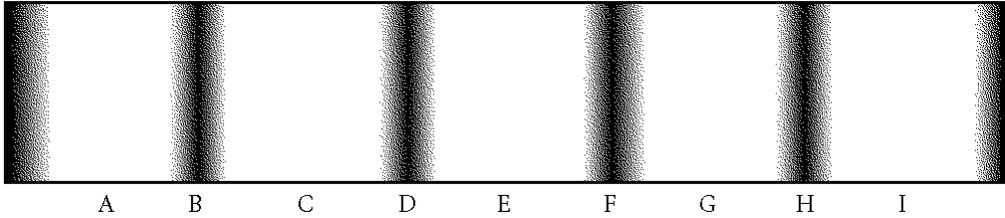
- ____ 24. Refraction is the bending of a wave disturbance as it passes at an angle from one ____ into another.
- medium
 - boundary
 - area
 - glass
- ____ 25. If a 325 W heater has a current of 6.0 A, what is the resistance of the heating element?
- 88 Ω
 - 54 Ω
 - 4.5 Ω
 - 9.0 Ω
- ____ 26. In a laser, all of the following forms of energy can be converted into coherent light *except*
- chemical energy.
 - light.
 - nuclear energy.
 - electrical energy.
- ____ 27. What is the wavelength of an infrared wave with a frequency of 4.2×10^{14} Hz?
- 1.4×10^5 m
 - 7.1×10 m
 - 7.1×10^{-6} m
 - 1.4×10^{-6} m
- ____ 28. Which is the *most* correct statement regarding the drawing of electric field lines?
- Electric field lines never cross each other.
 - Electric field lines always form closed loops.
 - Electric field lines can start on a charge of either polarity.
 - Electric field lines always connect from one charge to another.
- ____ 29. An object is 29 cm away from a concave mirror's surface along the principal axis. If the mirror's focal length is 9.50 cm, how far away is the corresponding image?
- 12 cm
 - 36 cm
 - 14 cm
 - 29 cm
- ____ 30. The distance between two slits in a double-slit interference experiment is 2.9×10^{-6} m. The first-order bright fringe is measured on a screen at an angle of 12° from the central maximum. What is the wavelength of the light?
- 3.0×10^2 nm
 - 4.6×10^2 nm
 - 6.0×10^2 nm
 - 1.2×10^2 nm



- ____ 31. In the diagram shown above, the image of object *B* would be
- virtual, reduced, and upright.
 - virtual, reduced, and inverted.
 - virtual, enlarged, and upright.
 - real, reduced, and upright.
- ____ 32. What effect will be produced on a capacitor if the separation between the plates is increased?
- It will decrease the capacitance.
 - It will increase the charge.
 - It will increase the capacitance.
 - It will decrease the charge.
- ____ 33. Electric field strength depends on
- elementary charge and radius.
 - charge and distance.
 - Coulomb constant and mass.
 - charge and mass.

- ___ 34. Object distance, image distance, and radius of curvature are ___ for curved mirrors.
- interdependent
 - directly related
 - unrelated
 - independent
- ___ 35. Atmospheric refraction of light rays is responsible for which of the following effects?
- total internal reflection in a gemstone
 - chromatic aberration
 - mirages
 - spherical aberration
- ___ 36. A beam of light in air is incident at an angle of 35° to the surface of a rectangular block of clear plastic ($n = 1.49$). What is the angle of refraction?
- 12°
 - 23°
 - 42°
 - 57°
- ___ 37. Which of the following is a device that produces an intense, nearly parallel beam of coherent light?
- spectroscope
 - diffraction grating
 - telescope
 - laser
- ___ 38. The image of an object in a flat mirror is always
- larger than the object.
 - the same size as the object.
 - smaller than the object.
 - independent of the size of the object.
- ___ 39. What type of mirror is used whenever a magnified image of an object is needed?
- convex mirror
 - flat mirror
 - concave mirror
 - two-way mirror
- ___ 40. The relationship between frequency, wavelength, and speed holds for light waves because
- light travels in straight lines.
 - all forms of electromagnetic radiation travel at a single speed in a vacuum.
 - different forms of electromagnetic radiation travel at different speeds.
 - light travels slower in a vacuum than in air.
- ___ 41. A high-voltage transmission line carries 1000 A at 700 000 V. What is the maximum power carried in the line?
- 100 MW
 - 70 MW
 - 700 MW
 - 400 MW
- ___ 42. When a straight line is drawn perpendicular to a flat mirror at the point where an incoming ray strikes the mirror's surface, the angles of incidence and reflection are measured from the normal and
- the angle of incidence is greater than the angle of reflection.
 - the angle of incidence can be greater than or less than the angle of reflection.
 - the angles of incidence and reflection are equal.
 - the angle of incidence is less than the angle of reflection.
- ___ 43. Which set of information will allow you to calculate the kilowatt•hr usage?
- the current and the time the circuit operates
 - the voltage and the resistance of the circuit
 - the voltage and current in the circuit
 - the resistance, the current, and the time the circuit operates
- ___ 44. An attracting force occurs between two charged objects when the charges are of
- unlike signs.
 - like signs.
 - unequal magnitude.
 - equal magnitude.
- ___ 45. If you know the wavelength of any form of electromagnetic radiation, you can determine its frequency because
- all wavelengths travel at the same speed.
 - wavelength and frequency are equal.
 - the speed of light increases as wavelength increases.
 - the speed of light varies for each form.
- ___ 46. A parabolic mirror, instead of a spherical mirror, can be used to reduce the occurrence of which effect?
- light scattering
 - chromatic aberration
 - spherical aberration
 - mirages

- ___ 47. If a virtual image is formed 10.0 cm along the principal axis from a convex mirror with a focal length of -15.0 cm, what is the object's distance from the mirror?
- 30 cm
 - 3.0 cm
 - 6.0 cm
 - 12 cm
- ___ 48. For high resolution in optical instruments, the angle between resolved objects should be
- as small as possible.
 - 45° .
 - as large as possible.
 - 1.22° .
- ___ 49. Coherence is the property by which two waves with identical wavelengths maintain a constant
- speed.
 - frequency.
 - amplitude.
 - phase relationship.
- ___ 50. Carbon tetrachloride ($n = 1.46$) is poured into a container made of crown glass ($n = 1.52$). If a light ray in the glass is incident on the glass-to-liquid boundary and makes an angle of 30.0° with the normal, what is the angle of the corresponding refracted ray with respect to the normal?
- 28.7°
 - 31.4°
 - 25.6°
 - 64.4°
- ___ 51. Which of the following wires would have the *least* resistance, assuming that all of the wires have the same cross-sectional area?
- a copper wire 5 cm in length
 - an iron wire 5 cm in length
 - a copper wire 10 cm in length
 - an iron wire 10 cm in length
- ___ 52. Two beams of coherent light are shining on the same sheet of white paper. When referring to the crests and troughs of such waves, where will darkness appear on the paper?
- where the crest from one wave overlaps the trough from the other
 - Darkness cannot occur because the two waves are coherent.
 - where the crest from one wave overlaps the crest from the other
 - where the troughs from both waves overlap
- ___ 53. If light waves are coherent,
- they have less than three different wavelengths.
 - their intensity is less than that of incoherent light.
 - they remain in phase.
 - they shift over time.
- ___ 54. Which process will double the power dissipated by a resistor?
- doubling the current while doubling the resistance
 - doubling the current and making the resistance half as big
 - doubling the current while making the potential difference half as big
 - doubling the current and doubling the potential difference
- ___ 55. If you looked at a light through the lenses from two polarizing sunglasses that were overlapped at right angles to each other,
- all of the light would pass through.
 - none of the light would pass through.
 - most of the light would pass through.
 - little of the light would pass through.
- ___ 56. What is the wavelength of microwaves of 3.0×10^9 Hz frequency?
- 0.060 m
 - 0.050 m
 - 0.20 m
 - 0.10 m
- ___ 57. How is current affected if the number of charge carriers decreases?
- The current increases.
 - The current initially decreases and then is gradually restored.
 - The current decreases.
 - The current is not affected.



The figure above shows the pattern of a double-slit interference experiment. The center of the pattern is located at E.

- ___ 58. In the double-slit interference experiment that produced the figure above, the two slits are moved closer. Which of the following would occur to the pattern shown in the figure?
- | | |
|--------------------------------|-------------------------------|
| a. F would shift to the right. | c. F would shift to the left. |
| b. E would shift to the right. | d. E would shift to the left. |
- ___ 59. Which sentence best describes electrical conductors?
- | |
|--|
| a. Electrical conductors are poor heat conductors. |
| b. Electrical conductors have low mass density. |
| c. Electrical conductors have electric charges that move freely. |
| d. Electrical conductors have high tensile strength. |
- ___ 60. In a laser, energy is added to a(n)
- | | |
|----------------|----------------------------------|
| a. light wave. | c. active medium. |
| b. mirror. | d. partially transparent mirror. |
- ___ 61. The process of charging a conductor by bringing it near another charged object and then grounding the conductor is called
- | | |
|--------------------|----------------------|
| a. neutralization. | c. polarization |
| b. induction. | d. contact charging. |
- ___ 62. When light passes at an angle to the normal from one material into another material in which its speed is higher,
- | |
|--|
| a. it is bent away from the normal to the surface. |
| b. it always lies along the normal to the surface. |
| c. it is unaffected. |
| d. it is bent toward the normal to the surface. |
- ___ 63. The ___ of light can change when light is refracted because the velocity changes.
- | | |
|--------------|-----------------|
| a. medium | c. wavelength |
| b. frequency | d. transparency |
- ___ 64. The angle between the first-order maximum and the central maximum for monochromatic light of 2300 nm is 27° . Calculate the number of lines per centimeter on this grating.
- | | |
|------------------|------------------|
| a. 2000 lines/cm | c. 1600 lines/cm |
| b. 4500 lines/cm | d. 2500 lines/cm |
- ___ 65. Snow reflects almost all of the light incident upon it. However, a single beam of light is not reflected in the form of parallel rays. This is an example of ___ reflection off a ___ surface.
- | | |
|----------------------|----------------------|
| a. diffuse, rough | c. regular, rough |
| b. regular, specular | d. diffuse, specular |

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